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**Cradle for a handset**

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US5155766 A  
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US5109412 A**

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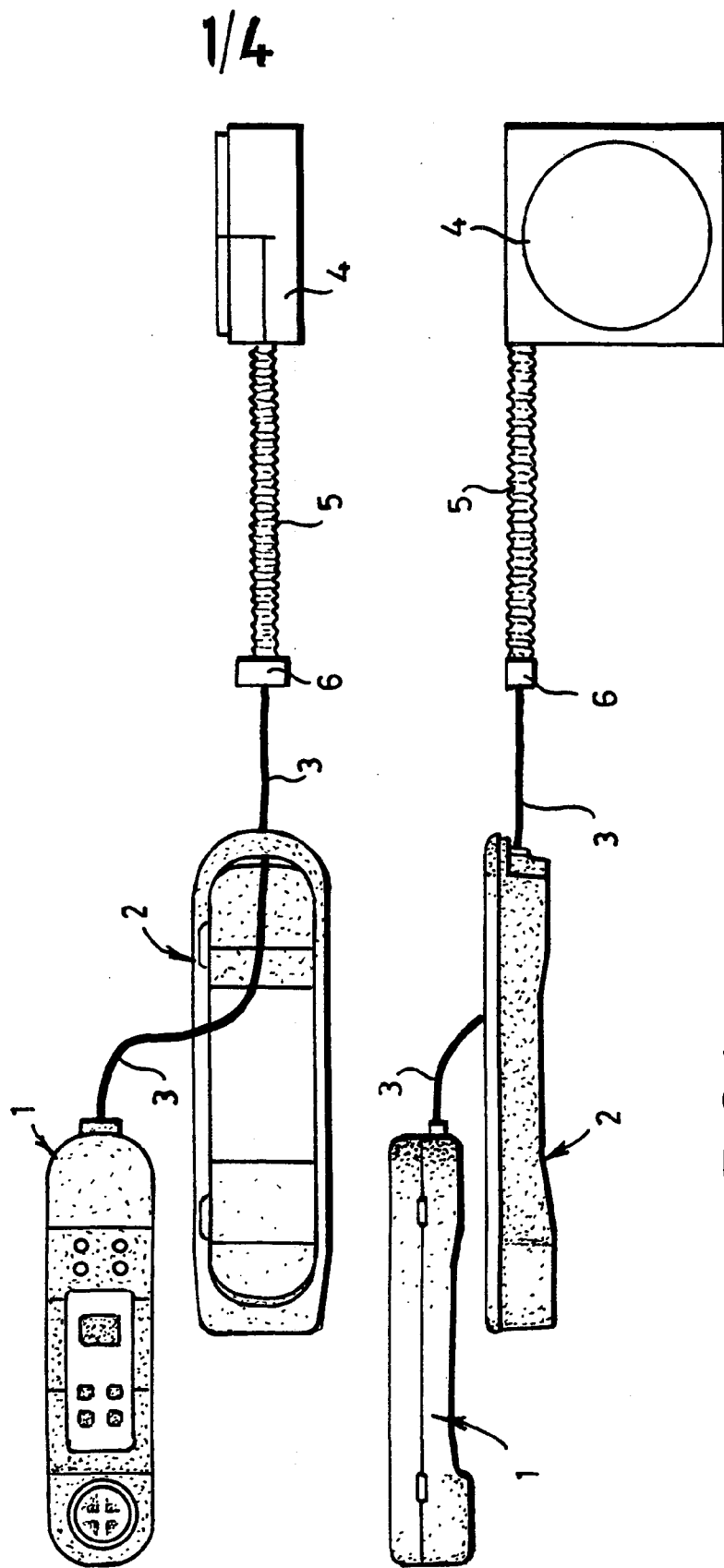


FIG.1

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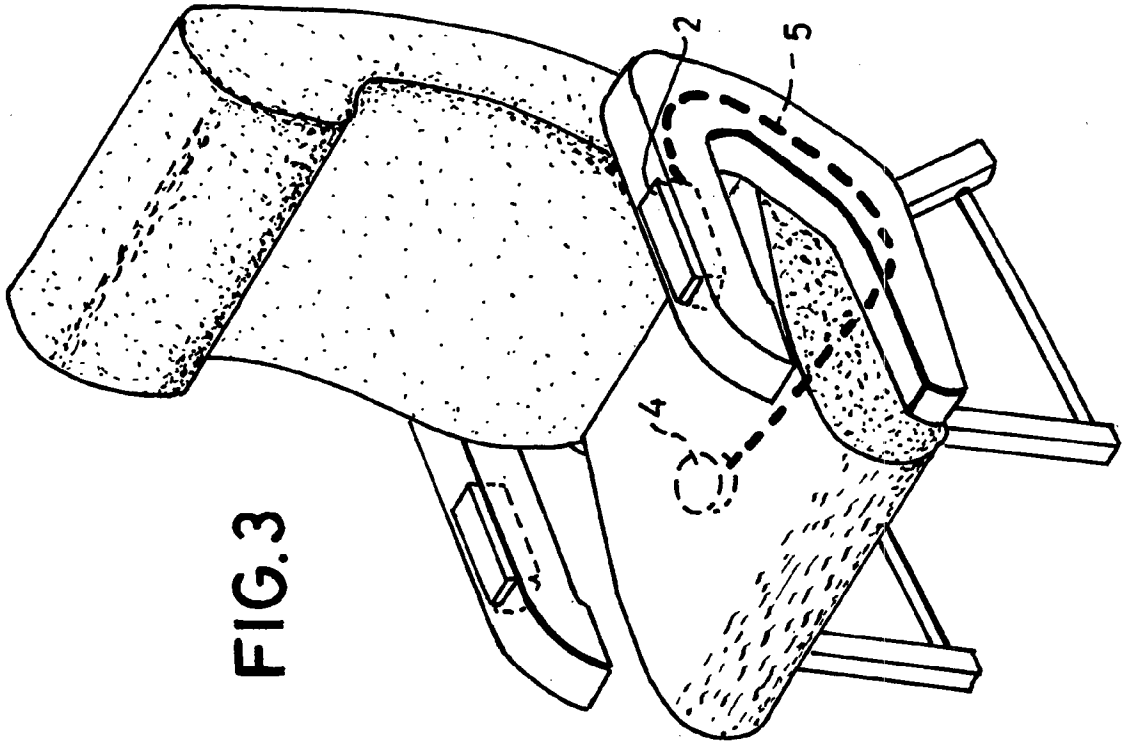


FIG. 3

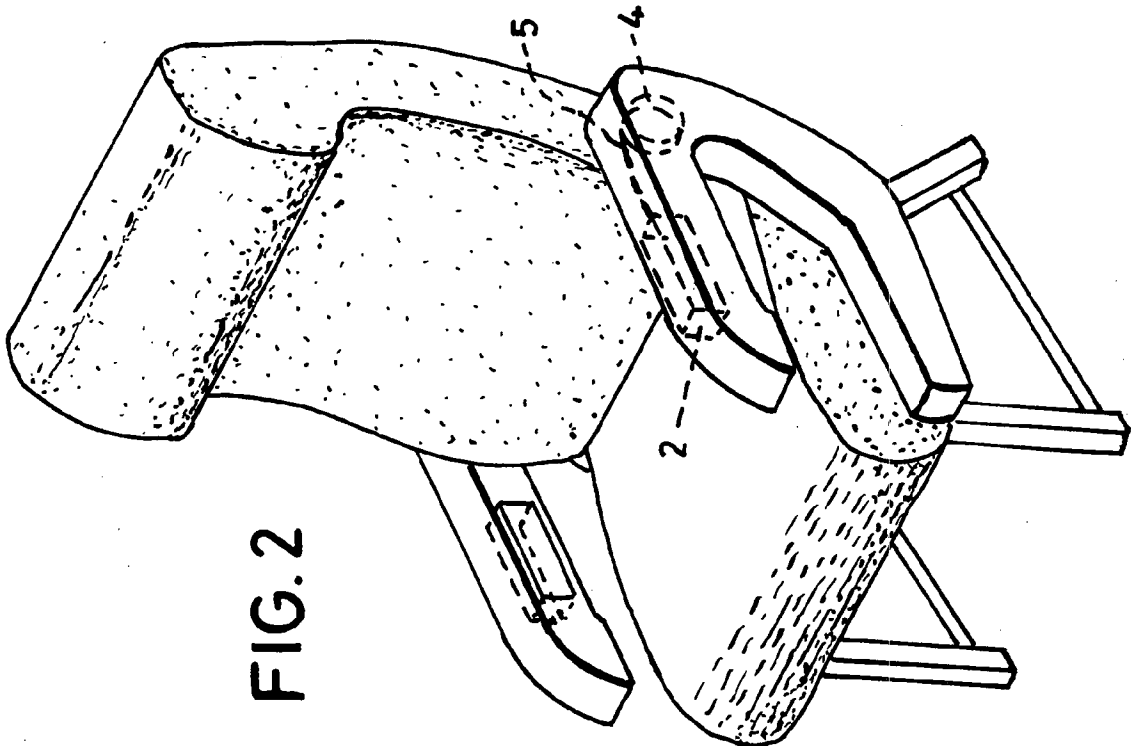


FIG. 2

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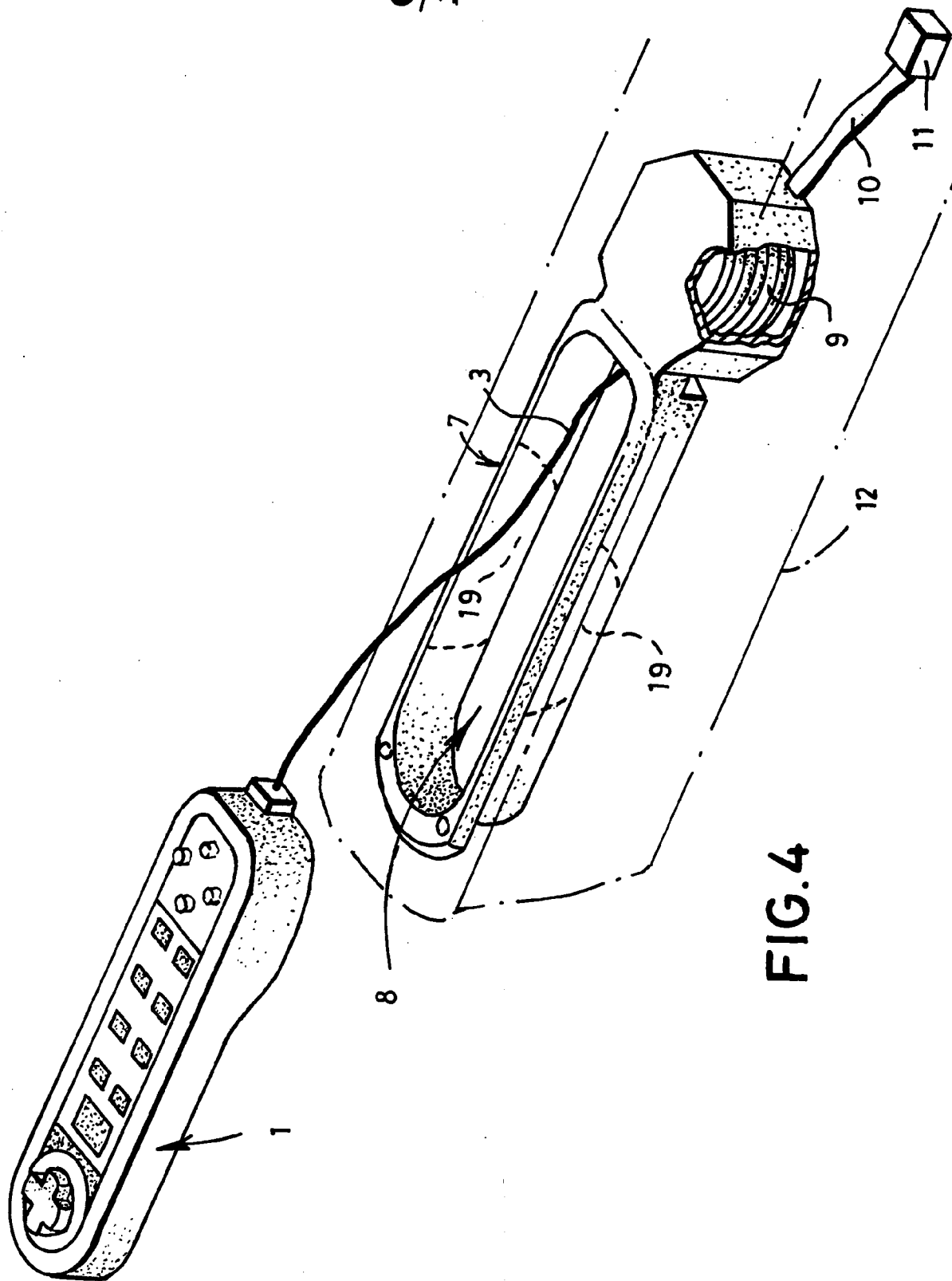


FIG.4

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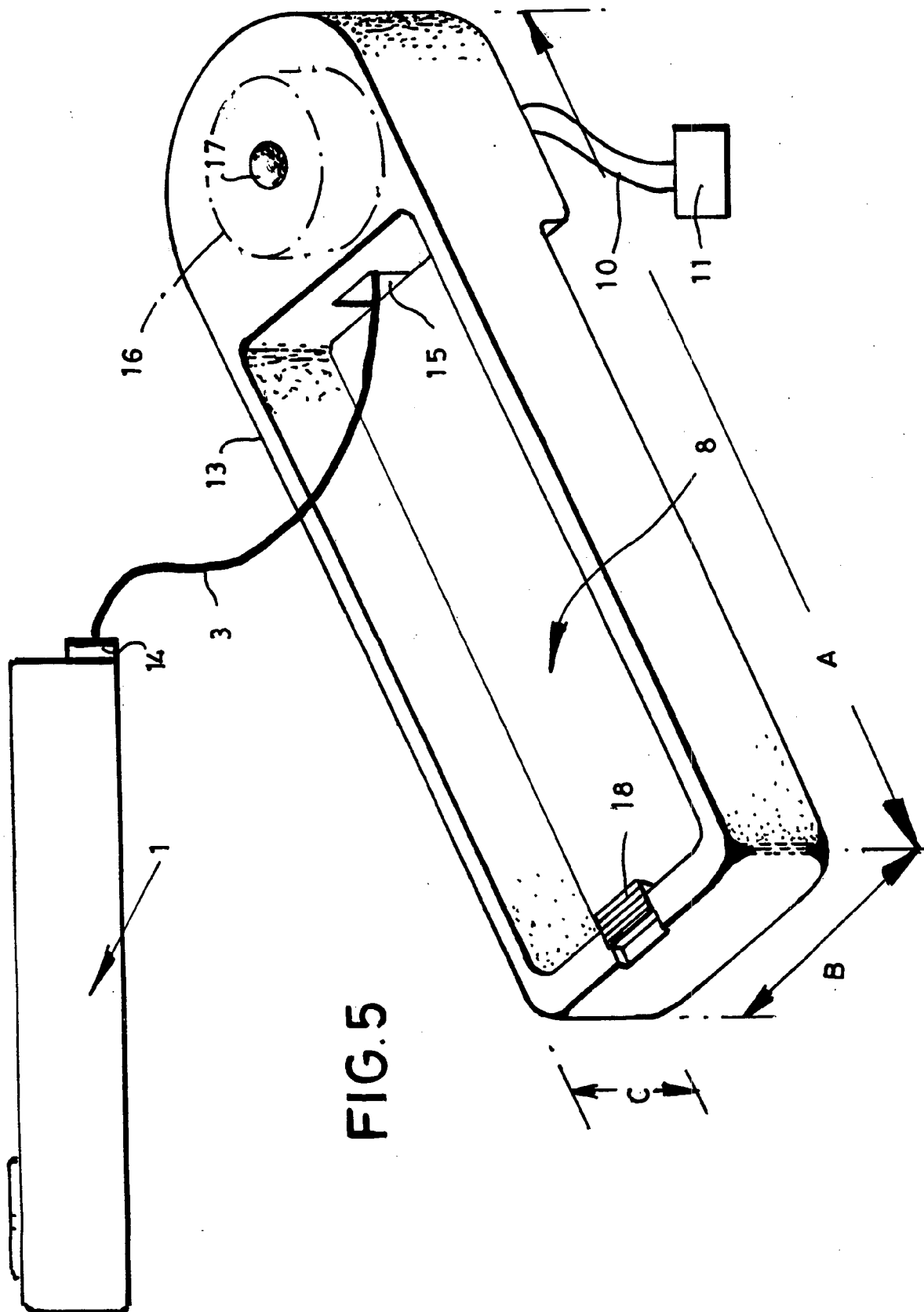


FIG. 5

## CRADLE FOR A HANDSET

This invention relates to a cradle for a handset, such as a telephone handset or remote control for electronic apparatus, and is particularly applicable to cradles for mounting in the armrests of chairs.

In the following "chair" includes all seating apparatus incorporating an arm (whether extending from a back of the chair, the seat of the chair, or both) and, for example, includes but is not limited to: seats in all modes of mass transport including aircraft, buses, rail and passenger vessels; seats in facilities for audience participation, such as theatres, arenas, lecture theatres and libraries; and seats for personal business or domestic use such as workstation chairs, and settees.

It is known to provide a cradle in the armrest of a chair, such as a seat in an aircraft, for housing a handset comprising, for example, a telephone and/or a remote controller for in-flight entertainment apparatus. Such handsets can also include call functions for the in-flight staff. A typical example is the model RU-AA6501-01 of Matsushita Electrical Industrial Company Limited of Osaka, Japan.

Conventionally such handsets sit and are cradled in a recess in an arm mounted cradle and are removable from the recess by lifting. The handset is electrically powered and connected via a cable which is housed in and may be drawn from a cable reel. The cable reel is conventionally of the ratchet type so that when the handset is lifted from the cradle the cable may be extended to a desired extent and locks in that position. To return the cable to the reel the cable is tugged to release the ratchet and then released so allowing a spring mechanism in the reel to draw the cable back into the reel. Figure 1 illustrates schematically the conventional arrangement of handset, cradle and reel. Figure 2 shows a typical arrangement with the cable reel mounted to the rear of a chair arm and Figure 3 shows a further typical arrangement with the cable reel mounted under the seat. The cable passes through a reinforced but flexible conduit extending from the cradle to the reel.

This conventional arrangement causes some problems:-

1. In both locations of the cable reel, separate mounting of the cradle and the reel, and the need to ensure free passage for the cable between the cradle and the reel, leads to time-consuming installation and servicing particularly as the cable can quickly become damaged if installation or servicing is defective.
2. Because the cable reel is remote from the cradle, cable reels have been of the above mentioned ratchet type. Many people do not understand how the ratchet mechanism works and as a consequence the handset is frequently not properly stowed leading to damage to the cable. Such incorrect stowing can contravene air safety regulations.
3. In the under seat location of Fig. 3 there is the additional installation problem of needing to carefully route the cable in its conduit to prevent damage by the seat mechanism. The long and sometimes convoluted pathways involved can lead to high friction between the cable and its housing conduit which slows down the cable reel and again can lead to high service costs.
4. The arm mounted location of Fig. 2, while desirable, is difficult to engineer. Generally the seat arm is too narrow and also contains other items of "furniture" such as ash trays, audio jacks, seat adjustment controls. Further, this location generally contains arm hinging mechanisms to allow the seat arm to swing up into the seat back.

Telephones with attached cord winding devices have been previously proposed (see US-A-5156242 and US-A-5241593). However these telephones were not amenable to fitting in the arms of chairs; do not restrain the handset in the cradle; and leave wire looping in free space where it can be inadvertently caught.

It has also been proposed to provide a remote control holder for wired remote controls for domestic television apparatus and the like (see US-A-4735377). The holder proposed in US-A-4735377 had a shelf on which the remote controller rested and a cable reel to retract the cable when the remote was not in use. The holder of US-A-4735377 was not amenable to fitting in the arms of chairs and did not restrain the handset in the cradle and no suggestion to do either is made in US-A-4735377. The purpose behind US-A-4735377 was to prevent wires looping around in the domestic environment.

The applicants have realised that in the chair arm context incorporating the cable reel into the cradle leads to many advantages:-

1. There is no need for a protective conduit around the cable and so frictional forces do not limit the take-up of cable.
2. Installation of the cradle is simplified since only electrical (and/or optical) connections need to be made and there is no need to carefully position a mechanical pathway for the cable.
3. Since the cable reel is now adjacent the cradle it becomes feasible, if desired, to use an alternative ratchet mechanism such as a pressbutton release ratchet (see for example GB-A-2210020) which is simpler for the user to understand.
4. The combined unit is far more robust than separate cradle and reel and is less prone to damage by either the user or service personnel.

The applicants have further realised that for robust use it is advantageous to provide a manually releasable latch to secure the handset into its cradle. (In the aircraft environment there is a requirement that the cradle withstand a 16g crash landing without releasing the handset).

Accordingly the present invention provides a cradle for housing a handset capable of connection to apparatus, the cradle comprising a body adapted to be secured at least partially recessed within a chair arm, the width of the body containable within a surface of the chair arm substantially no greater than 7.5 cm wide, the body comprising:-

- a) a recess adapted to releasably receive the handset in a cradled rest position ;
  - b) a cable reel housed in the body and carrying a retractably extendible cable, the cable being connectable by a first end to the handset, such that in use removal of the handset from its cradled rest position extends the cable from the cable reel, the cable reel being biased for retraction of the cable and comprising a releasable lock to secure the cable at a required length
- and
- c) a latch to secure the handset in its cradled rest position.

It should be noted that the term "cable" in this specification includes the use of optical fibres either additionally or in place of electrical conductors and, for infrared or other wireless transmission systems, include the use of a tether provided to prevent removal of the handset.



Further aspects of the invention are apparent from the appended claims and the following description with reference to the drawings in which:-

Fig.1 is a general schematic arrangement in plan and side elevation of a conventional chair arm mounted cradle and handset;

Fig. 2 is a schematic perspective view of a conventional chair arm mounted cradle and handset showing arm mounting of the cable reel;

Fig. 3 is a schematic perspective view of a conventional chair arm mounted cradle and handset showing chair mounting of the cable reel;

Fig 4 is a schematic perspective view of a cradle in accordance with the invention; and

Fig. 5 is a schematic perspective view of a second embodiment of cradle in accordance with the invention.

In Fig. 1 handset 1 is securable in cradle 2. The handset 1 is connected to a cable 3 which extends to cable reel 4. The cable passes out of cradle 2 via an aperture (not shown) and for a large part of its length is shielded by a reinforced flexible conduit 5 as is well known. One end of the conduit 5 is secured adjacent the cable reel 4 and the other end is secured by a clip 6 which allows free passage of the cable 3 but holds the conduit 5. The clip 6 is secured close to the cradle 2.

Figs. 2 and 3 show the path of the conduit 5 from the cable reel 4 to the cradle 2 and it can be seen that in Fig.3 the passage from cable reel 4 to the cradle 2 is not a straight line and kinks in the pathway can lead to friction between the conduit 5 and the cable 3. To fit a cradle as shown in Figs. 1 to 3 requires the installer to separately secure the cable reel 4 and cradle 2, to lead the cable 3 in its conduit 5 to the required position, to secure the conduit 5 to the clip 6, to secure the clip 6 either to the chair arm or the cradle 2, and to connect the cable 3 to the handset 1.

Fig. 4 shows a first embodiment of the invention. Handset 1 is securable in cradle 7 which comprises a recess 8. The handset 1 is connected to a cable 3 which extends via an aperture (not shown) to integral cable reel 9 housed in cradle 7. The integral cable reel 9 may be of any conventional type but conveniently may be of the known ratchet type such as, for example,

supplied by MBM Technology Limited under part number ACEEC1106-A. Cable 10 extends from the integral cable reel 9 to a connector 11.

The cradle 7 may be mounted in a chair arm 12 (shown as broken lines) and connector 11 simply joined to a connector to external apparatus. This is a drastically simpler procedure than fitting the prior art chair arm cradles of Figs. 1 to 3.

Fig. 5 shows handset 1 securable in cradle 13 which comprises a recess 8. The handset 1 is connected by a fitting 14 to a cable 3 which extends through aperture 15 to an integral cable reel 16 (shown schematically in broken lines) housed in cradle 13.

The integral cable reel is of a manual pull, spring biased return, push button release type and may be, for example, such as disclosed in GB-A-2210020. Push button 17 on the surface of cradle 13 may be used to release a ratchet or cam operating on cable reel 16 so allowing spring bias to retract the cable. It will be clear to the person skilled in the art that many types of manually released cable reels may be used and this invention is not limited to ratchet mechanisms nor to push button release. Slide buttons, toggle switches and other releases may be used to release the cable for return to the cable reel.

The cable reels in Figs. 4 and 5 are shown lying generally horizontally but this is not essential, the position of the reel being chosen to suit the dimensions available for the cradle. For narrow but deep chair arms vertical mounting of the reel may be more appropriate.

By choice of a suitably compact reel (such as the MBM Technology Limited reel part number ACEEC1106-A mentioned above) it is possible to mount two cradles back to back and in the side of an aircraft chair arm to allow two passengers to use the handsets simultaneously. Typical dimensions of the cradle of Fig. 5 are length A about 27.5cm, width B about 6.5cm and depth C about 3.5 cm. It can be seen that in a typical aircraft chair arm of width about 7.5cm one cradle may be mounted on the top or two cradles may be mounted in the opposed sides of the chair arm.

Cable 10 extends from the integral cable reel to a connector 11.

When in its rest position, cradled in the recess 8, the cable fitting 14 nests inside aperture 15 so that the cable 3 is concealed from view, and inadvertent snagging, by the handset 1. To avoid inadvertent release of the handset a latch 18 is provided. Any form of latch may be used such as, for example: a spring arm that engages with the handset on the handset's return to its cradled rest position and is displaceable manually to release the latch; a magnetic latch releasable simply on tugging the handset; a spring loaded ball latch engaging with an indentation on the handset. Other means of releasing the latch may be used, for example coin or card released latches may be used for paid systems. It will be clear that many variants are possible to meet the purpose of the latch, namely to releasably secure the handset in its cradled rest position.

In use the handset of Figs. 4 and 5 sits in the recess 8 and is removable therefrom by lifting substantially along a single removal axis (i.e. a roughly vertical axis), removal of the handset obliquely to said single removal axis being restrained by the walls of the recess. This reduces the risk of accidentally removing the handset from its cradled rest position. It will be apparent to the person skilled in the art that any form of walls will suffice and they need not be continuous. For example side panels 19 (shown in broken lines on Fig. 4) could be removed leaving a shoe at either end of the recess restraining the handset from lateral movement. Other constructions such as upstanding pins will perform the same service.

In Fig. 4 the cradle is shown recessed into the arm of a chair. It will be apparent that full recessing or partial recessing are options that can be followed with the present invention as required.

## CLAIMS

1. A cradle for housing a handset capable of connection to apparatus, the cradle comprising a body adapted to be secured at least partially recessed within a chair arm, the width of the body containable within a surface of the chair arm substantially no greater than 7.5 cm wide, the body comprising:-
  - a) a recess adapted to releasably receive the handset in a cradled rest position ;
  - b) a cable reel housed in the body and carrying a retractably extendible cable, the cable being connectable by a first end to the handset, such that in use removal of the handset from its cradled rest position extends the cable from the cable reel, the cable reel being biased for retraction of the cable and comprising a releasable lock to secure the cable at a required lengthand
  - c) a latch to secure the handset in its cradled rest position.
2. A cradle according to claim 1 wherein the body is substantially no greater than 6.5 cm wide.
3. A cradle as claimed in claim 1 or 2 in which the releasable lock comprises a ratchet or a cam.
4. A cradle as claimed in any preceding claim in which the releasable lock is released by a manually operable button on the body.
5. A cradle as claimed in any preceding claim in which the cable reel has an aperture communicating with the recess and through which the cable passes to the handset, the aperture and cable being hidden from view when the handset is in its cradled rest position.
6. A cradle as claimed in any preceding claim at least partially mounted within the top of a chair arm.
7. A pair of cradles as claimed in any of claims 1 to 4 and mounted back to back at least partially within opposed sides of a chair arm.